



# Books: Electronic Titles from NCBI

A collection of online books from different sources for end user browsing

<https://www.ncbi.nlm.nih.gov/books/>

National Center for Biotechnology Information • National Library of Medicine • National Institutes of Health • Department of Health and Human Services

## Scope and Access

The NCBI Books database, also known as Bookshelf, is a searchable collection of online biomedical textbooks and other literature. In addition to some classic biology and medical textbooks and monographs, it also includes books and reports/documents produced by the National Library of Medicine (NLM) and the National Center for Biotechnology Information (NCBI). Currently, the Books database contains over several hundred titles. Contents of the Books database are directly accessible from the Books homepage at:

[www.ncbi.nlm.nih.gov/books/](http://www.ncbi.nlm.nih.gov/books/). Details on how to use the Books database are provided in the Bookshelf help document:

[www.ncbi.nlm.nih.gov/books/NBK3833/](http://www.ncbi.nlm.nih.gov/books/NBK3833/)



## Books Homepage

On the Books homepage, entering a query term and clicking the Search button (A) performs a search against all contents in the database. The Using Bookshelf section (B) contains links to help documents. The complete list of available titles is accessed through the Browse Titles link (C). Specific information for publishers interested in submitting their titles to Books is available through the Authors and Publishers link (D). Titles under the New & Updated and Featured Titles sections link (E) to the Table of Content pages of these titles.

## Searching

Searching the entire bookshelf should be started from the Books homepage. The example (right) displays matches found for "mutL homolog" (F), which lists matches organized by titles (G), with section under the "Top results for this book" (H). More topic specific searches can be conducted using the Advanced page (I). There indexed fields and terms indexed under a field can be selected and viewed using the pull-down menu (J) and the "Show index list" (K), respectively. A selected term is entered in the field-limited form automatically (L).

The screenshot displays the NCBI Bookshelf homepage and a search results page. The homepage includes sections for 'Using Bookshelf', 'Read', 'Participate', 'New & Updated', and 'Featured Titles'. A search for 'mutL homolog' is performed, resulting in 17 books. The search results are organized by titles (G), with section under the 'Top results for this book' (H). The Advanced Search Builder is also shown, with a search for 'molecular biology of the cell' (L) and a list of indexed fields (J) and terms (K).

**Using Bookshelf**

- Quick Start Guide
- FAQ
- Tutorials
- Copyright and Permissions

**Read**

- Browse Titles
- New Releases
- PubReader
- Follow @ncbibooks

**Participate**

- Authors and Publishers
- How to Apply
- Participation Agreement

**New & Updated**

- Evidence for models of diagnostic service provision in the community: literature mapping

**Featured Titles**

- Family History and Improving Health: Evidence Reports/Technology Assessments, No. 186

**More Information**

- NLM Literature Archive
- Open Access Subset

**Search Results: 17 books (29 items)**

- Maternal Control of Development in Vertebrates: My Mother Made Me Do It!**  
Marlow FL.  
San Rafael (CA): Morgan & Claypool Life Sciences; 2010.  
Top results in this book Table of Contents
- PDQ Cancer Information Summaries [Internet]**  
Bethesda (MD): National Cancer Institute (US); 2002-  
Top results in this book Table of Contents
- The Cell: A Molecular Approach. 2nd edition**  
Cooper GM.  
Sunderland (MA): Sinauer Associates; 2000.  
Top results in this book Table of Contents
- Molecular Cell Biology. 4th edition**  
Lodish H, Berk A, Zipursky SL, et al.  
New York: W. H. Freeman; 2000.  
Top results in this book Table of Contents
- DNA Damage and Repair and Their Role in Carcinogenesis**

**Books Advanced Search Builder**

"molecular biology of the cell"[Title]

Edit Builder

Title "molecular biology of the cell"[Title]

Hide index list

Previous 200 Next 200

Refresh index

Show index list

## Browsing and Filtering Available Titles Using the Browse Titles Link

The complete list of available titles is available through the "Browse Titles" page linked from the Books homepage. Here, titles can be narrowed down using a combination of existing filters on Subjects, Types and Publishers (A). Custom terms can also be entered (B) to filter the list of titles to locate more specific entries. Clicking the "More" link (C) brings out the complete list of options for that category. The example (D) is a result from filtering with Book, Cell Biology from all publishers.

**Browse Titles**

Select a category or enter filter term below.

Filter term:  in Title or Contributor Go Reset

**Subjects**  
Cell Biology (7) Change selection

**Types**  
Book (7) Change selection

**Publishers**  
All Publishers More

**Versions/Editions**  
Current titles in Bookshelf  
Include previous versions/editions

**Display Settings:** ☒ Sorted by Pub Date (Reverse) Send to: ☒ Save link: ☒

**7 Titles**

- [Pancreatic Cancer and Tumor Microenvironment](#)  
Grippio PJ, Munshi HG, editors.  
Trivandrum (India): Transworld Research Network; 2012.  
Book | Cancer, Cell Biology
- [TRP Channels](#)  
Zhu MX, editor.  
Boca Raton (FL): CRC  
Book | Cell Biology, Li
- [Mechanosensitivity](#)  
Kamkin A, Kiseleva  
Moscow: Academia; 2  
Book | Cell Biology, Ph
- [Annual Reviews Collection \(Internet\)](#)  
Bethesda (MD): National Center for Biotechnology Information (US); 2002 Nov.  
Book | Cell Biology, Biochemistry
- [Molecular Biology of the Cell, 4th edition](#)  
Alberts B, Johnson A, Lewis J, et al.  
New York: Garland Science; 2002.  
Book | Molecular Biology, Cell Biology

**Publishers Filter Options:**

- ☐ Academia (1)
- ☐ CRC Press/Taylor & Francis (1)
- ☐ Garland Science (1)
- ☐ National Center for Biotec ... (1)
- ☐ Sinauer Associates (1)
- ☐ Transworld Research Network (1)
- ☐ W. H. Freeman (1)

Apply

## Browsing and Searching the Content of a Title

It is often more productive to browse and/or search the contents in a title-specific manner. Clicking a icon or its text title located in the Browse Title page opens the main page for that entry (shown below left). For books with copyright restrictions, a note is placed at the top (E) to indicate that its content cannot be browsed chapter by chapter. Sections for such entries are not linked within the book (F). Searching with terms of interest is the only way to access the content from such books (G).

**Bookshelf** Books Search

[Browse Titles](#) [Limits](#) [Advanced](#)

**E** By agreement with the publisher, this book is accessible by the search feature, but cannot be browsed.

**Molecular Biology of the Cell, 4th edition**

Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, and Peter Walter.

New York: [Garland Science](#); 2002.  
ISBN-10: 0-8153-3218-1 ISBN-10: 0-8153-4072-9

[Copyright and Permissions](#)

Search this book **G**

**Excerpt**

Molecular Biology of the Cell is the classic in-depth text reference in cell biology. By extracting fundamental concepts and meaning from this enormous and ever-growing field, the authors tell the story of cell biology, and create a coherent framework through which non-expert readers may approach the subject. Written in clear and concise language, and illustrated with original drawings, the book is enjoyable to read, and provides a sense of the excitement of modern biology. Molecular Biology of the Cell not only sets forth the current understanding of cell biology (updated as of Fall 2001), but also explores the intriguing implications and possibilities of that which remains unknown.

**Contents** **F**

- Acknowledgments
- Preface
- A Note to the Reader
- Part I. Introduction to the Cell
- Part II. Basic Genetic Mechanisms
- Part III. Methods
- Part IV. Internal Organization of the Cell
- Part V. Cells in Their Social Context
- Glossary

[Expand All](#) [Collapse All](#)

**Bruce Alberts** received his Ph.D. from Harvard University and is President of the National Academy of Sciences

By agreement with the publisher, this book is accessible by the search feature, but cannot be browsed.

[Copyright](#) © 2002, Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, and Peter Walter; Copyright © 1983, 1989, 1994, Bruce Alberts, Dennis Bray, Julian Lewis, Martin Raff, Keith Roberts, and James D. Watson.

**BLAST Help**

NCBI Help Manual

[National Center for Biotechnology Information](#)  
U.S. National Library of Medicine

This manual documents the [BLAST](#) (Basic Local Alignment Search Tool) command line application developed at the National Center for Biotechnology Information (NCBI).

**Contents** **H**


- [Introduction to BLAST](#)
- [BLAST Help Manual Overview](#)  
Tom Madden.  
Created: January 28, 2011.
- [User Manuals](#)
- [Standalone BLAST Setup for Windows PC](#)  
Tao Tao.  
Created: May 31, 2010; Last Update: October 10, 2012.
- [Standalone BLAST Setup for Unix](#)  
Tao Tao.  
Created: May 31, 2010; Last Update: May 31, 2010.
- [BLAST Command Line Applications User Manual](#)  
Christiam Camacho, Thomas Madden, Ning Ma, Tao Tao, Richa Agarwala, and Alex Morgulis.  
Created: June 23, 2008; Last Update: July 30, 2013.
- [BLAST+ Release Notes](#)  
Christiam Camacho.  
Created: March 12, 2013; Last Update: March 21, 2013.
- [BLAST FTP Site](#)  
Tao Tao, Tom Madden, Christiam Camacho, and Lee Szilagyi.  
Created: May 29, 2011; Last Update: May 29, 2011.
- [Developer Manuals](#)
- [SOAP-based BLAST Web Service](#)  
Christiam Camacho and Tom Madden.  
Created: March 2, 2011; Last Update: July 15, 2011.

For books without such a restriction, such as the help manuals for different NCBI resources, items under Contents (H) are hyperlinked to the actual chapter/section for browsing within a web browser window.

## Searching for Contents Specific to a Subject Within a Book Title

Bookshelf Books

Display Settings: Summary

 [Molecular Biology of the Cell, 4th edition.](#)  
Alberts B, Johnson A, Lewis J, et al.  
New York: Garland Science; 2002.

▼ [Top results in this book:](#) [Table of Contents](#)  
[DNA Replication Mechanisms.](#)   
[The Molecular Basis of Cancer-Cell Behavior.](#)

Contents specific to a subject within a book title can be searched by entering relevant terms in the search box as shown by the example (A or B). Clicking on a section (C) opens its full display.

**Molecular Biology of the Cell, 4th edition**  
Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, and Peter Walter.  
New York: Garland Science; 2002.  
ISBN-10: 0-8153-3218-1 ISBN-10: 0-8153-4072-9  
[Copyright and Permissions](#)

## Books Record Display

The full display of books (D) links key terms to their definition, which is viewable upon mouseover (E). Scrolling to a subsection can be done using the anchor links in the "In this page" section of the right hand column (F) or the popup menu under the "Go to" link (G). The example below is for the marked subsection (H).

**A Strand-directed Mismatch Repair System Removes Replication Errors That Escape from the Replication Machine**

As stated previously, bacteria such as *E. coli* are capable of dividing once every 30 minutes, making it easy to screen large populations to find a rare [mutant](#) cell that is altered in a specific process. One class of mutants contains alterations in so-called [mutator genes](#), which greatly increase the rate of [spontaneous mutation](#) when they are inactivated. Not surprisingly, one such mutant makes a defective form of the 3' proofreading exonuclease that is a part of the [DNA polymerase enzyme](#) (see [Figures 5-9 and 5-10](#)). When its activity is defective, the DNA polymerase no longer proofreads effectively, and many replication errors that otherwise have been removed accumulate in the DNA.

The study of other *E. coli* mutants exhibiting abnormally high [mutation rates](#) has uncovered another proofreading system that removes replication errors made by the polymerase that have been missed by the 3' proofreading exonuclease. This [strand-directed mismatch repair](#) system detects the potential for distortion in the DNA double helix that results from the misfit between noncomplementary [base pairs](#). But if the proofreading system recognizes a mismatch in newly replicated DNA and randomly corrects one of the two mismatched nucleotides, it would mistakenly "correct" the original [template](#) strand to match the error exactly half the time, thereby failing to lower the overall error rate. To be effective, such a proofreading system must be able to distinguish and remove the mismatched [nucleotide](#) only on the newly synthesized strand, where the error occurred.

... ..

In eucaryotes, the mechanism for distinguishing the newly synthesized strand from the parental [template](#) strand at the site of a mismatch does not depend on [DNA methylation](#). Indeed, some eucaryotes—including *Yeast* and *Drosophila*—do not methylate any of their DNA. Newly synthesized DNA strands are known to be preferentially [nicked](#), and biochemical experiments reveal that such [nicks](#) (also called [single-strand breaks](#)) provide the signal that directs the mismatch proofreading system to the appropriate strand in a eucaryote (Figure 5-23).

**Figure 5-23**  **DNA methylation**  
Addition of a methyl group to DNA. Extensive methylation of the cytosine base in CG sequences is used in vertebrates to keep genes in an inactive state.

**Views**  
Cite this Page  
Disable Glossary Links

**In this Page**  
Base-Pairing Underlies DNA Replication and DNA Proofreading Mechanisms  
The DNA Replication Fork Is Asymmetrical  
The High Fidelity of DNA Replication Requires Several Proofreading Mechanisms  
Only DNA Replication in the 5'-to-3' Direction Allows Efficient Error Correction  
A Special Nucleotide-Polymerizing Enzyme Synthesizes Short RNA Primer Molecules on the Lagging Strand  
Special Proteins Help to Open Up the DNA Double Helix in Front of the Replication Fork  
A Moving DNA Polymerase Molecule Stays Connected to the DNA by a Sliding Ring  
The Proteins at a Replication Fork Cooperate to Form a Replication Machine  
A Strand-directed Mismatch Repair System Removes Replication Errors That Escape from the Replication Machine  
DNA Topoisomerases Prevent DNA Tangling During Replication  
DNA Replication Is Similar in Eucaryotes and Bacteria  
Summary  
Recent Activity

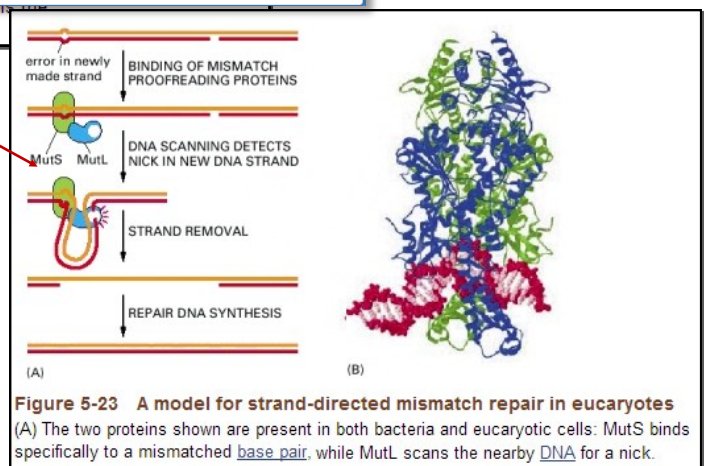
**Base-Pairing Underlies DNA Replication and DNA Proofreading Mechanisms**  
The DNA Replication Fork Is Asymmetrical  
The High Fidelity of DNA Replication Requires Several Proofreading Mechanisms  
Only DNA Replication in the 5'-to-3' Direction Allows Efficient Error Correction  
A Special Nucleotide-Polymerizing Enzyme Synthesizes Short RNA Primer Molecules on the Lagging Strand  
Special Proteins Help to Open Up the DNA Double Helix in Front of the Replication Fork  
A Moving DNA Polymerase Molecule Stays Connected to the DNA by a Sliding Ring  
The Proteins at a Replication Fork Cooperate to Form a Replication Machine  
A Strand-directed Mismatch Repair System Removes Replication Errors That Escape from the Replication Machine  
DNA Topoisomerases Prevent DNA Tangling During Replication  
DNA Replication Is Similar in Eucaryotes and Bacteria  
Summary

**Figure 5-23**  
A model for strand-directed mismatch repair in eucaryotes. The two proteins shown are present in both bacteria and eucaryotic cells: MutS binds specifically to a mismatched [base pair](#), while MutL scans the nearby DNA for a nick. Once a nick is found, (more...)

**(A)** error in newly made strand  
BINDING OF MISMATCH PROOFREADING PROTEINS  
DNA SCANNING DETECTS NICK IN NEW DNA STRAND  
STRAND REMOVAL  
REPAIR DNA SYNTHESIS

**(B)**

To facilitate reading, tables and figures are linked instead of being shown within the full display. Clicking a link, such as the one for Figure 5.23 (I), brings out the full figure along with its legend in a popup window shown to the right.





## NCBI Help Manuals from the Books Database

A comprehensive set of help documents on NCBI resources is available through the Books database. The content is organized under a single master entry, which can be located using the "Browse Titles" page by filtering available titles

with "NCBI help manual" (A). Clicking the title of that master entry (B) displays a list of individual help manuals, each links to a resource-specific help document.

**Browse Titles**  
Select a category or enter filter term below.  
Filter term: ncbi help manual (A) in Title or Contributor


**Subjects**  
All Subjects  
Computational Biology (1)  
Information Science (1)  
[More](#)

**Types**  
All Types  
Collection (1)

**Publishers**  
All Publishers  
National Center for Biotechnology Information (US) (1)

**Display Settings:** ☒ Sorted by Pub Date (Reverse) [Send to:](#) ☒ [Save link:](#) ☒

1 Titles for "ncbi help manual"

1.  [NCBI Help Manual \[Internet\]](#).  
Bethesda (MD): National Center for Biotechnology Information (US); 2010-  
Copyright and Permissions

**Entrez Programming Utilities Help**  
Bethesda (MD): National Center for Biotechnology Information (US); 2010-  
[Copyright and Permissions](#)

**NCBI Help Manual**  
National Center for Biotechnology Information (US)  
Bethesda (MD): National Center for Biotechnology Information (US); 2010-  
[Copyright and Permissions](#)

The NCBI Help Manual is a collection of help documents for resources at the National Center for Biotechnology Information.

**Contents**  
[BioProject Help](#)  
[BLAST Help](#)  
[Bookshelf Help](#)  
[Entrez Help](#)  
[Entrez Programming Utilities Help](#)  
[Entrez Sequences Help](#)  
[Epigenomics Help](#)  
[GaP FAQ Archive](#)  
[The GenBank Submissions Handbook](#)  
[Gene Help](#)  
[LinkOut Help](#)  
[My NCBI Help](#)  
[NCBI Large Data Download Best Practices](#)  
[NIH Manuscript Submission Help](#)  
[NLM Catalog Help](#)  
[Protein Clusters Help](#)  
[PubMed Help](#)  
[PubMed Central Help](#)  
[RefSeq Help](#)  
[SNP FAQ Archive](#)  
[Sequence Read Archive \(SRA\) Handbook](#)  
[SRA Application Notes](#)  
[SRA Knowledge Base](#)  
[Taxonomy Help](#)  
[Web Link Help](#)

**Introduction to the E-utilities**  
• [YouTube E-utilities Introduction](#)  
• Please see the [Release Notes](#) for details and changes.

The Entrez Programming Utilities (E-utilities) are a set of eight server-side programs that provide a stable interface into the Entrez query and database system at the National Center for Biotechnology Information (NCBI). The E-utilities use a fixed URL syntax that translates a standard set of input parameters into the values necessary for various NCBI software components to search for and retrieve the requested data. The E-utilities are therefore the structured interface to the Entrez system, which currently includes 38 databases covering a variety of biomedical data, including nucleotide and protein sequences, gene records, three-dimensional molecular structures, and the biomedical literature.

**Contents** [Expand All](#) [Collapse All](#)  
[E-utilities Quick Start](#)  
Created: December 12, 2008; Last Update: August 9, 2013.  
[A General Introduction to the E-utilities](#)  
[Sample Applications of the E-utilities](#)  
Created: April 24, 2009; Last Update: January 26, 2010.  
[The E-utilities In-Depth: Parameters, Syntax and More](#)  
Created: May 29, 2009; Last Update: January 23, 2015.  
[The E-utility Web Service \(SOAP\)](#)  
Created: January 21, 2010; Last Update: January 23, 2015.  
[Entrez Direct: E-utilities on the UNIX Command Line](#)  
Created: April 23, 2013; Last Update: July 5, 2016.

**Entrez Programming Utilities Help [Internet]** [Show details](#)  
[Contents](#)

**Entrez Direct: E-utilities on the UNIX Command Line**  
Jonathan Kans, PhD<sup>1</sup>.  
NCBI  
[jkans@ncbi.nlm.nih.gov](mailto:jkans@ncbi.nlm.nih.gov)  
<sup>1</sup>Corresponding author.  
Created: April 23, 2013; Last Update: July 5, 2016.

**Getting Started**

**Introduction**  
Entrez Direct (EDirect) is an advanced method for accessing the NCBI's set of sequence, structure, gene, variation, expression, etc.) from a UNIX terminal via command-line arguments. Individual operations are combined to build multi-step formatting normally complete the process.

EDirect also provides an argument-driven function that simplifies the extraction of other results that are returned in structured XML format. This can eliminate the answer ad hoc questions. Queries can move seamlessly between EDirect commands to perform actions that cannot be accomplished entirely within Entrez.

**Installation**  
EDirect will run on UNIX and Macintosh computers that have the Perl language installed, and under the Cygwin UNIX-emulation environment on Windows PCs.

**Views**  
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**In this Page**  
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[Examples](#)  
[Appendices](#)  
[Release Notes](#)  
[For More Information](#)

Clicking the title of an entry, such as Entrez Programming Utilities Help (C), opens the document with section headings (D) linking to additional details. The right-hand column provides links to alternative display formats (E) and subsection titles (F) for navigating among different sub-sections.